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| 10/648,079 | 08/26/2003 | Xiaolan Ai | TIMK 8736US | 3356 |

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EXAMINER

LEWIS, TISHA D

ART UNIT PAPER NUMBER

3681

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/648,079

Applicant(s)

AI ET AL.

Examiner

TISHA D. LEWIS

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-32 is/are allowed.
- 6) ☒ Claim(s) 1,3-13 and 19-24 is/are rejected.
- 7) ☒ Claim(s) 2 and 14-18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

The following is a first action on the merits of application serial no. 10/648,079, filed on August 26, 2003.

Information Disclosure Statement

The information disclosure statement filed on August 26, 2003 has been acknowledged.

Specification

The abstract of the disclosure is objected to because in line 2, --be-- should be inserted between "to" and "operated". Correction is required. See MPEP § 608.01(b).

Claim Objections

Claims 1, 25 and 26 are objected to because of the following informalities:

- In claim 1, line 17, after "coupling", "said" should be deleted.
- In claim 1, line 24, after "control", "of" should be deleted.
- In claim 25, line 3, before "ring", --a-- should be inserted.
- In claim 26, line 7, the second comma (,) after "branch" should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 4, 6-8, 10, 11 and 19-24 are rejected under 35 U.S.C. 102(b) as being unpatentable by Schmidt et al ('595). As to claim 1, Schmidt et al discloses a

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power transmission system having a drive shaft (918), an engine (924) having an output shaft (912), a pair of planetary trains (920, 922) coupled between the engine and drive shaft including a sun gear (934, 956), a ring gear (932, 954), a set of planet gears (936, 952) and a carrier (938, 950), a first electric machine (916) linked with at least one member (956) of the first planetary, a second electric machine (914) linked with at least one member (934) of the second planetary, a set of torque transfer components operatively coupled to the planetary trains including a clutch (957) coupling a member (950) of the first train to a member (938) of the second train and a brake (959) coupling a member (938) of the second train to a fixed member (946) of the transmission, an engine control (960, when controlling engine power) providing target engine torque according to vehicle parameters (i.e., vehicle parameters, speed ratio, etc.) and a power control (960, when controlling electric power flow) coupled to the first and second machines to regulate power delivered to the drive shaft and control the torque transfer components via input signals from the operator to change speed ratios.

As to claim 3, Schmidt et al discloses the power control having a control structure for the machines wherein purely electric power or combined power with the engine is used according to the speed ratio (low or high speed) between the drive shaft and engine output shaft.

As to claim 4, Schmidt et al discloses the power control having one of the first or second machines manipulated to act as a motor to provide torque to regulate the speed ratio between the drive shaft and output shaft.

As to claims 6-8, Schmidt et al discloses the power control controlling the torque transfer components according to a speed ratio selected via operator demand by coupling two components (938, 950) of the planetary trains in an output or compound power split configuration.

As to claim 10, Schmidt et al discloses an energy storage device (926) coupled to the machines and the power control to regulate power flow between the machines.

As to claim 11, Schmidt et al discloses the engine control configured to shut the engine off during pure electric power from the machines responsive to a predetermined set of operating conditions (low speed, start up, etc.) and the power control via the torque components decouple the trains and regulate the power flow from the energy storage device to at least one machine to provide power to the drive shaft through the second train.

As to claim 19, Schmidt et al discloses the power control controlling the torque transfer components (957) to decouple the planetary trains to drive the first machine from the engine to the first train to generate electric power (926) and to drive the drive shaft in reverse (when reverse ratio is requested) from the second machine through the second train and regulate the power flow from the first machine to the second machine.

As to claim 20, Schmidt et al disclose the first planetary used as an amplifier or reducer of speed between the output shaft and first machine and the second planetary as an amplifier or reducer of speed between the second machine and drive shaft.

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As to claims 21-24, Schmidt et al discloses a hybrid mode (engine with machine), a non-hybrid mode (engine), an electric only operation (purely electric flow) and a series hybrid mode (series and parallel).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 4, 6-8, 10, 11 and 19-24 are rejected under 35 U.S.C. 102(e) as being unpatentable by Holmes et al ('705). As to claim 1, Holmes et al discloses a power transmission system having a drive shaft (18), an engine (14) having an output shaft (13), a pair of planetary trains (40, 42) coupled between the engine and drive shaft including a sun gear (52, 60), a ring gear (50, 58), a set of planet gears (54, 62) and a carrier (56, 64), a first electric machine (26) linked with at least one member (52) of the first planetary, a second electric machine (28) linked with at least one member (60) of the second planetary, a set of torque transfer components operatively coupled to the planetary trains including a clutch (48) coupling a member (52) of the first train to a member (58) of the second train and a brake (46) coupling a member (58) of the second train to a fixed member (946) of the transmission, an engine control (32) providing target engine torque according to vehicle parameters (i.e., vehicle parameters, speed ratio, etc.) and a power control (32 with 30) coupled to the first and second machines to regulate power delivered to the drive shaft and control the torque transfer components via input signals from the operator to change speed ratios.

As to claim 3, Holmes et al discloses the power control having a control structure for the machines wherein purely electric power or combined power with the engine is used according to the speed ratio (low or high speed) between the drive shaft and engine output shaft.

As to claim 4, Holmes et al discloses the power control having one of the first or second machines manipulated to act as a motor to provide torque to regulate the speed ratio between the drive shaft and output shaft.

As to claims 6-8, Holmes et al discloses the power control controlling the torque transfer components according to a speed ratio selected via operator demand by coupling two components (52, 58) of the planetary trains in an output or compound power split configuration.

As to claim 10, Holmes et al discloses an energy storage device (30) coupled to the machines and the power control to regulate power flow between the machines.

As to claim 11, Holmes et al discloses the engine control configured to shut the engine off during pure electric power from the machines responsive to a predetermined set of operating conditions (low speed, start up, etc.) and the power control via the torque components decouple the trains and regulate the power flow from the energy storage device to at least one machine to provide power to the drive shaft through the second train.

As to claim 19, Holmes et al discloses the power control controlling the torque transfer components (via 48) to decouple the planetary trains to drive the first machine from the engine to the first train to generate electric power (via 30) and to drive the drive

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shaft in reverse (when reverse ratio is requested) from the second machine through the second train and regulate the power flow from the first machine to the second machine.

As to claim 20, Holmes et al disclose the first planetary used as an amplifier or reducer of speed between the output shaft and first machine and the second planetary as an amplifier or reducer of speed between the second machine and drive shaft.

As to claims 21-24, Holmes et al discloses a hybrid mode (engine with machine), a non-hybrid mode (engine), an electric only operation (purely electric flow) and a series hybrid mode (series and parallel).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-13 and 19-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Xiaolan ('856) (due to provisional application filed on October 22, 2001). As to claim 1, Xiaolan discloses a power transmission system having a drive shaft (18), an engine (not shown) having an output shaft (16), a pair of planetary trains (12, 14) coupled between the engine and drive shaft including a sun gear (12A, 14A), a ring gear (12B, 14B), a set of planet gears (12C, 14C) and a carrier (12D, 14D), a first electric machine (20) linked with at least one member (12A) of the first planetary, a second electric machine (22) linked with at least one member (14B) of the second planetary, a set of torque transfer components operatively coupled to the planetary trains including a clutch (24) coupling a member (12A) of the first train to a member (14A) of the second train and a brake (26) coupling a member (14A) of the second train to a fixed member

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(28) of the transmission, an engine control (throttle) providing target engine torque according to vehicle parameters (i.e., vehicle parameters, speed ratio, etc.) and a power control (30) coupled to the first and second machines to regulate power delivered to the drive shaft and control the torque transfer components via input signals from the operator to change speed ratios.

As to claim 3, Xiaolan discloses the power control having a control structure for the machines wherein purely electric power or combined power with the engine is used according to the speed ratio (low or high speed) between the drive shaft and engine output shaft.

As to claim 4, Xiaolan discloses the power control having one of the first or second machines manipulated to act as a motor to provide torque to regulate the speed ratio between the drive shaft and output shaft.

As to claim 5, Xiaolan discloses the power control controlling one of the first and second machines to balance power in the planetary trains.

As to claims 6-8, Xiaolan discloses the power control controlling the torque transfer components according to a speed ratio selected via operator demand by coupling two components (12A, 14A) of the planetary trains in an output or compound power split configuration.

As to claim 9, Xiaolan discloses the power control controlling the torque transfer components to alter couplings between the planetary trains at an output and compound power split at a node point where the speed of the first or second machine is zero [0055].

As to claim 10, Xiaolan discloses an energy storage device (32) coupled to the machines and the power control to regulate power flow between the machines.

As to claim 11, Xiaolan discloses the engine control configured to shut the engine off during pure electric power from the machines responsive to a predetermined set of operating conditions (low speed, start up, etc.) and the power control via the torque components decouple the trains and regulate the power flow from the energy storage device to at least one machine to provide power to the drive shaft through the second train [0048].

As to claim 12, Xiaolan discloses the power control responsive to a first node point regulating torque between the machines by a first and second regime [0055 to 0064].

As to claim 13, Xiaolan discloses the power control responsive to a speed ratio greater than a switch point to regulate torque between the machines in a third regime [0066].

As to claim 19, Xiaolan discloses the power control controlling the torque transfer components (via 24) to decouple the planetary trains to drive the first machine from the engine to the first train to generate electric power (via 32) and to drive the drive shaft in reverse (when reverse ratio is requested) from the second machine through the second train and regulate the power flow from the first machine to the second machine [0050].

As to claim 20, Xiaolan disclose the first planetary used as an amplifier of speed between the output shaft and first machine and the second planetary as a reducer of speed between the second machine and drive shaft.

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As to claims 21-24, Xiaolan discloses a hybrid mode (engine with machine), a non-hybrid mode (engine), an electric only operation (purely electric flow) and a series hybrid mode (series and parallel).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 6-9 of copending Application No. 10/451,303. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claim 1 of the present application encompasses the limitations of the co-pending application as follows a power transmission having a pair of planetary trains each having a sun gear, ring gear, planet gears and a planet carrier, a pair of electric machines (first linked to one member of the first planetary and the second linked to one member of the second planetary), a power control unit coupled to the electric machines, at least one torque transfer device couple one or more members of the first planetary to one or more members of the

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second planetary (a clutch coupling a member of the first train to a member of the second train and a brake coupling a member of the second train to a fixed member).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

Claims 2 and 14-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 25-32 are allowed. The following is an examiner's statement of reasons for allowance: The prior art of record does not disclose or render obvious a motivation to provide for:

-(As to claim 25) a method for a hybrid operation in a power transmission system including a first electric machine coupled to a sun member of a first planetary unit and a second electric machine coupled to a sun member of a second planetary unit in combination with ***all*** the remaining limitations of claim 25.

-(As to claim 26) a method for a hybrid operation in a power transmission system including identifying an output drive shaft speed and driver inputs, calculating an engine output using the output drive shaft speed and driver input and determining an engine operating point based on a performance objective in combination with ***all*** the remaining limitations of claim 26.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kotani ('592), Schmidt ('676), Arimitsu et al ('960), Moeller ('353), Wakuto et al ('233), Hata et al ('898), Oshidari et al ('534), Urasawa et al ('055), Schmidt ('671), Bowen ('201), Hiraiwa ('600), and Holmes ('631) are cited as having a power hybrid transmission using a first and second electric machine coupled to a pair of planetary sets.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to TISHA D. LEWIS whose telephone number is 703-305-0921. The examiner can normally be reached on M-Thur 8 AM TO 3 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CHARLES A. MARMOR can be reached on 703-308-0830. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tdl
September 29, 2004


TISHA LEWIS
PRIMARY EXAMINER
Au 3681 9/29/04